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(54) SCREED PLATE FOR ROAD FINISHERS

(71) We, JOSEPH VOGELE A.G., a German company of Neckarauer Strasse 168—228,, 6800 Mannheim 1, West Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a screed plate for finishers for concrete or bituminous road surfaces, comprising a main plate fixed on support arms of the finisher, and at least one extra plate which is disposed after the main plate as considered in the direction of operation and which extends approximately over half the length of the main plate and which is connected to the main plate by means of guides and is laterally extensible by means of a displacement drive.

In order that the operating or finishing width of road finishers can be infinitely varied, particularly for the construction of urban thoroughfares, DOS 25 22 457 discloses a screed plate consisting of a fixed main plate and two slidable extra plates. The main plate is of divided construction so that a roof-shaped profile can be obtained, and is accommodated at its ends by support arms which are articulated on the road finisher so as to be vertically adjustable. Each half of the main plate has two parallel guide tubes which extend over the entire length of half the main plate and which are open at the free ends of the main plate and slidably receive guide rods. An extra plate is fixed on each guide rod end projecting from the guide tubes, the extra plates being situated behind the main plate as considered in the direction of operation and occupying approximately half the length of the main plate. At its inner end each extra plate bears on the guide tubes by way of another plate and can be extended laterally beyond the main plate by means of a displacement drive, usually a jack unit. The two extra plates can be extended and retracted simultaneously and independently of one another.

In road finishing, the surface is frequently required to be thicker or thinner on one side of the road. To this end, the point of articulation of the corresponding support arm on the finisher is raised or lowered so that the angle of attack of the screed plate is changed. This unilateral change of the angle of attack results in the screed plate being turned. With the above-described screed plate which, of course, consists of a main plate and two slidable or laterally extensible extra plates, only the main plate connected directly to the support arms is involved in this turning movement. However, as a result of this turning movement the two guide tubes are turned in relation to one another so that on the one hand the guide rods are jammed in the guide tubes while on the other hand the plates are jammed on said tubes. As soon as the two support arms resume the same position, this jamming is obviated. This means that the extra plate is not slidable if the road finishing thickness is unequal and hence if the support arms are in an unequal position or if the main plate is turned. Although these disadvantages could be obviated by increasing the play between the guide tubes and the guide rods or plates, it would impair the reliable guidance between the main plate and the extra plates with the two support arms in the same position.

The invention, therefore, seeks to provide a road finisher screed plate consisting of a main plate and at least one extra plate so constructed that the extra plate is reliably guided on the main plate so that it can still be extended and retracted even if the main plate is in a turned position.

According to this invention, we provide a screed plate for a finisher for concrete or bituminous road surfaces, comprising a main plate fixed on support arms of the finisher, and at least one extra plate which is disposed behind the main plate in the direction of operation and which extends approximately over half the length of the main plate and which is connected to the main

plate by means of guides and is laterally extensible by means of a displacement drive, and wherein the main plate carries a guide tube for receiving guide means connected to the extra plate, two guide elements are provided in spaced superposed relationship at the outer rear end of the main plate, and a rail fixed on the extra plate is guided between said guide elements. This construction gives a three point type of suspension or guidance for the extra plate, and we have found that in the event of the main plate turning this system obviates jamming.

Further features and advantages of the invention will be explained in detail hereinafter with reference to an exemplified embodiment illustrated in the drawings wherein:

Figure 1 is an elevation of a screed plate according to the invention, and

Figure 2 is a side or front elevation of the left-hand half of the screed plate in partial section.

Fig. 1 of the drawing shows just the end of two support arms 1 of a known road finisher, said arms being situated one behind the other in the drawing plane and being pivotally connected to a road finisher so as to be vertically adjustable in known manner and supporting a screed plate 2. In this exemplified embodiment, the screed plate comprises two support plates 3 which are bolted to the support arms 1 and in which a main plate 4 is fixed. To obtain a roof-shaped profile, the main plate 4 is divided in the middle, only its left-hand half being shown in Fig. 2.

A guide tube 5, which is machined both on the inside and the outside, and which is divided in the middle like the main plate 4, is disposed between the two support plates 3 above the main plate 4. The support plate 3 has an aperture (not shown) in the zone where the guide tube 5 is fixed, said aperture being in alignment with the internal cross-section of the guide tube 5 so that it is possible to insert a tube 6 into the guide tube 5 from the outer side of the support plate 3, tube 5 receiving tube 6 in slidable relationship. A guide rod 7 also in the form of a tube is mounted slidably in tube 6 and its end situated in tube 6 is closed by a cover 8 rigidly connected to guide rod 7. Cover 8 has an aperture to receive a pull rod 9, whose end projecting into the guide rod 7 is secured, for example by nuts 10. A driver plate 11 is fixed to the other end of the pull rod 9 and co-operates with the inner end face of the tube 6, as explained hereinafter.

A plate 12 is fixed on the outer end face of the guide rod 7. Guide tube 5 also carries a slidable plate 13 which is of approximately the same shape as the plate 12. Plates 12, 13 extend horizontally beyond the support plates 3 and are rigidly interconnected at this end by a profiled rail 15 and by a frame 14 extending in the longitudinal direction of the main plate 4. This means that the two plates 12, 13 and the frames 14 and the rail 15 form a rigid body held slidably on or in the guide tube 5 and pivotable about the axis of the latter.

To prevent this pivoting movement or allow it only when required, a support member 16 is fixed on the outer support plate 3 and two rollers 17, 18 are mounted thereon spaced one above the other. The arrangement and construction of the rollers 17, 18 are such that said rollers guide between them a web of the profiled rail 15. The guide rod 7 together with the outer plate 12, the inner plate 13 guided on the guide tube 5, and the rollers 17, 18 with the rail 15, give a three-point type of suspension for the frame 14. The mountings for the rollers 17, 18 are constructed as eccentrics in known manner (not shown), said eccentrics being uniformly rotatable so that the frame 14 can pivot slightly with respect to the support plates 3 and hence with respect to the main plate 4. As a modification of the exemplified embodiment explained, the rollers 17, 18 can be replaced by short pads which are also held pivotally on eccentrics.

In the present exemplified embodiment, an extra plate 19, which occupies approximately half the length of the main plate 4 and is situated in spaced and parallel relationship behind the same is placed beneath the frame 14. To accommodate the extra plate 19, frame 14 has two lugs 20 which are disposed near the ends and on which the extra plate 19 is guided to be both pivotal and vertically adjustable by way of a ball joint 21. Four spindles 22 are also bolted in the frame 14, two spindles 22 being associated with each lug 20. At its end remote from the frame 14, each spindle 22 has a ball head (not shown), received by a casing 23 of appropriate construction fixed on the extra plate 19. The vertical position of the extra plate 19 and its transverse and longitudinal inclination are adjustable by means of these spindles 22 independently of the main plate 4. The extra plate is held so as to have no play in relation to the frame 14 by means of a prestressed compression spring 25, e.g. a laminated spring, which bears against the lug 20 and which is accommodated in a recess 24 in the extra plate 19. The spindles 22 may be adjusted either manually or by means of a drive, the two spindles 22 associated with each lug 20 having a common drive. This has a favourable effect in respect of the adjustment of a particular roof-shaped profile for the road surface. In modification of this exemplified embodiment the spindles 22 can be replaced by jacks.

A displacement drive 26, which is indicated only diagrammatically in Fig. 1, and which, for example, is in the form of a hydraulically actuated jack unit, is provided between the plate 12 and a support (not shown) on main plate 4, and by this means the extra plate 19 can be laterally extended or retracted relative to the main plate 4 at any time during the finishing operation.

In its basic position, the extra plate 19 does not project beyond the main plate 4. The fully extended position of the extra plate 19 is obtained when the plate 13 bears against the support plate 3. When the extra plate 19 is extended, only the guide rod 7 is initially displaced in the tube 6, the latter retaining its basic position in the guide tube 5. When approximately half the extension distance has been travelled, the nuts 10 bear against the cover 8. On a further extension movement, the tube 6 is then driven via the pull rod 9 and the driver plate 11 by means of the guide rod 7 and thus moved out of the guide tube 5. The length of the pull rod 9 is such that the tube 6 is still guided in tube 5 over about half its length even when the extra plate 19 is fully extended. At the same time, however, the guide rod 7 is still guided over approximately half its length in the tube 6. This construction of the guide rod 7, tube 6 and guide tube 5 in the form of a telescopic tube ensures good guidance even when the extra plate 19 is fully extended.

A second extra plate 19 can similarly be disposed on the other half of the main plate — this is the usual case — so that the working width of the screed plate 2 or main plate 4 can be extended on both sides.

In modification of the exemplified embodiment explained, the guide rod 7 can be fitted directly into the guide tube 5. In that case, however, the extension distance of the extra plate 19 must be reduced so that the guide rod 7 remains in the guide tube 5, by about one-third of its length. The displacement drive can also be shifted directly to the guide tube or the guide tube may be constructed as a hydrostatic displacement drive. Also, a stop rod can be fixed in the guide tube 5 to limit the travel of the tube 6. In that case, however, the pull rod 9 must consist of a tube open at its end bearing the driver plate 11, and having a stop here for the slide-in stop rod. A compression spring is then advantageously provided between the driver plate 11 and the hollow guide rod 7.

WHAT WE CLAIM IS:—

1. A screed plate for a finisher for concrete or bituminous road surfaces, comprising a main plate fixed on support arms of the finisher, and at least one extra plate which is disposed behind the main plate in the direction of operation and which extends approximately over half the length of the main plate and which is connected to the main plate by means of guides and is laterally extensible by means of a displacement drive, and wherein the main plate carries a guide tube for receiving guide means connected to the extra plate, two guide elements are provided in spaced superposed relationship at the outer rear end of the main plate, and a rail fixed on the extra plate is guided between said guide elements.

2. A screed plate according to claim 1, wherein the guide means are constructed in the form of a telescopic tube.

3. A screed plate according to claim 1 or 2, wherein the guide elements are disposed on eccentrics.

4. A screed plate according to claim 1, 2 or 3, wherein the guide elements are constructed as rollers.

5. A screed plate according to claim 1, 2 or 3, wherein the guide elements are constructed as pivotal blocks.

6. A screed plate as claimed in any preceding claim, wherein the extra plate is suspended pivotally from a frame and is adjustable relative thereto as to height and/or inclination.

7. A screed plate according to claim 6, wherein the extra plate is suspended pivotally from the frame by spindles having a common adjustment drive.

8. A screed plate for a road finisher substantially as hereinbefore described with reference to the accompanying drawing.

9. A finisher for concrete or bituminous road surfaces comprising a screed plate according to any one of the preceding claims.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

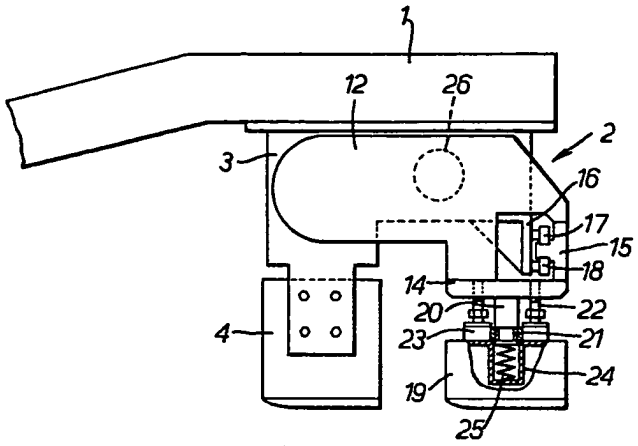

FIG. 1.

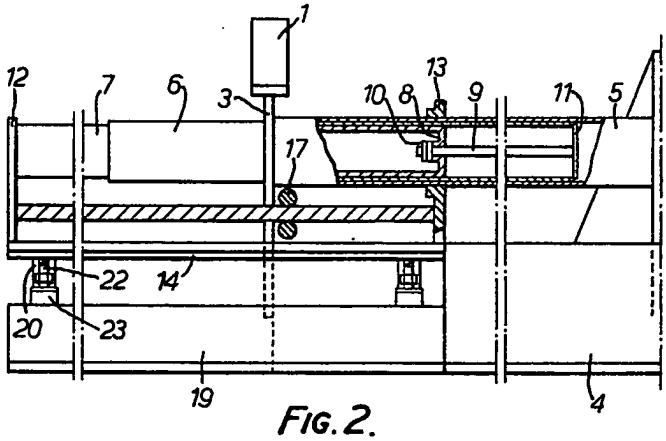

FIG. 2.